

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
30 June 2005 (30.06.2005)

PCT

(10) International Publication Number  
WO 2005/060164 A2

(51) International Patent Classification<sup>7</sup>: H04L 12/28

(21) International Application Number:  
PCT/EP2004/014434

(22) International Filing Date:  
17 December 2004 (17.12.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
03029448.2 19 December 2003 (19.12.2003) EP

(71) Applicant (for all designated States except US): SONY INTERNATIONAL (EUROPE) GMBH [DE/DE]; Kemperplatz 1, 10785 Berlin (DE).

(72) Inventors; and

(75) Inventors/Applicants (for US only): BÖHNKE, Ralf [DE/DE]; Brackenheimerweg 14, 73732 Esslingen (DE). NOGUEIRA-NINÉ, Juan [ES/ES]; Hindelanger Str. 7, 70327 Stuttgart (DE). WULLICH, Volker [DE/DE]; Bockelstr. 92, 70619 Stuttgart (DE). KRÄMER,

Oliver [DE/DE]; Eckartshaldenweg 19, 70191 Stuttgart (DE). RUHM, Ingo [DE/DE]; Prachenau Nr. 5, 02894 Vierkirchen (DE). WANG, Zhaocheng [CN/CN]; Laupheimer Str. 6, 70327 Stuttgart (DE). REBMAN, Jochen [DE/DE]; Marbacher Str. 21, 71522 Backnang (DE).

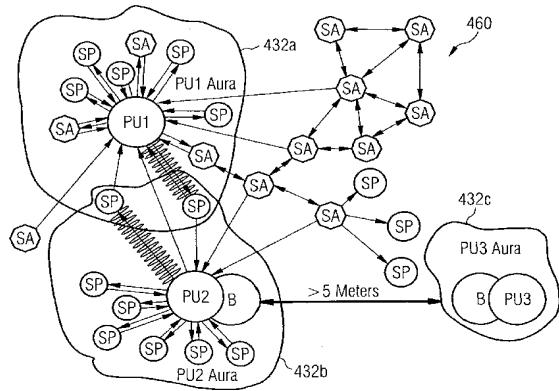
(74) Agent: RUPP, Christian; Mitscherlich & Partner, Sonnenstrasse 33, Postfach 33 06 09, 80066 München (DE).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,

*[Continued on next page]*

(54) Title: WIRELESS COMMUNICATION NETWORK ARCHITECTURE



WO 2005/060164 A2

(57) Abstract: A heterogeneous wireless network topology is suited for low power, short-range and ubiquitous ad-hoc communication, said network topology being capable of integrating different wireless transmission technologies, in particular to a wireless sensor network (WSN) including different node types (PUs, SAs and/or SPs) and communication technologies. The network is highly heterogeneous and can be operated according to the master-slave principle or in a distributed ad-hoc manner. The nodes (PUs, SAs and/or SPs) can have different wireless communication means tailored to their individual role in the network and other constraints, thus allowing different communication patterns. A remote polling and control system (430, 450, 460, or 470) in a heterogeneous wireless sensor network (WSN) comprises a master node (PU) having an RF transceiver (aTx and aRx) for sending (SOa) a wake-up signal to at least one remote slave node (SP, SA) of a first and/or second type for polling (Sob) information detected by said slave node (SP) or triggering functions to be executed, sending (SOC) control information for triggering a function to be executed by at least one remotely controllable slave node (SA) of said second type and receiving (Sod) feedback information from the remotely controllable slave node (SA) of said second type, said slave nodes (SAs, SPs) being in a stand-by mode before and after being called by the master node (PU).



FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**Published:**

- *without international search report and to be republished upon receipt of that report*